

# An Approach to Granting Subsidies to College Students in China Using Big Data

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## Abstract

China has made great improvement on subsidizing poverty-stricken students, but the current approaches of granting subsidies is not scientific or humane. Poverty-stricken students who couldn't get sufficient subsidies in suitable ways need some new and more scientific granting approaches, which inspires me to go about this study. The approach, we have introduced, which has been adopted by University of Science and Technology of China, using Big Data, with which college grant subsidies according to scientific investigation and data analysis of students' consumption in school canteens, is the key to resolve this problem. By adopting this approach, colleges and universities will do a better job in aiding poverty-stricken students financially and emotionally, which will be a meaningful improvement.

**Key Words:** Subsidies of Poverty-stricken Students, Big Data, Consumption Analysis

## 1. Introduction

In China, there are still a large number of poverty-stricken areas. College students who are suffering from financial difficulties account for a great proportion of all students in college (Yang Shaozheng, 2015). Poverty-stricken student's management is one of the most important jobs college authorities need to reckon with. If these students get managed well, they can finish academic work successfully with a thankful heart, becoming contributors to the society in the future. If not, they may still overcome difficulties alone and with great effort or they may simply drop out. Either way, they can't grow into useful persons with high intelligence and psychological health otherwise they can. That will be a big trouble and great loss for Chinese colleges and the whole society.

In all the management measures of poverty-stricken students, granting financial support is always the key. It is associated with education equity and social stability. In this article I will start out with a description on the current situation of granting subsidies to poverty-stricken students, pointing out its shortcomings specifically. Then aiming to these problems, I will present an approach to granting subsidies based on using Big Data and explicate how this approach will function. First though, a brief account of other scholars' opinions on this subject so as to make sense and compare with our approach presented later.

## 2. Literature Review

Many scholars have made a profound study on granting financial support to poverty-stricken students. Zhao Licheng (2013) suggested that in order to mobilize all ranks of society and expand channels of raising fund, government and college should propagandize the significance of subsidizing poverty-stricken students through linkage mechanisms by using newspaper, internet, TV, broadcast and so forth. Li Guiping (2014) proposed that in order to strengthen and improve financial assistance to poverty-stricken students in colleges, we need to remodel our working conception, cultivate their self-survivability and help them have all-round development. Li Hui, (2015) summed up that we have only focused on the financial support to the poverty-stricken students while neglecting psychological assistance. He mentioned that poverty-stricken students suffer a lot of mental stress, such as inferiority and anxiety, because of economic difficulties and the feeling of being at weak positions. Tao Enjin, Chen Fanghui, (2016) began considering something more detailed and in practical respect. These two scholars introduced that we could do the public assessment in class about students' daily consumption to affirm and evaluate poverty-

stricken students objectively, making sure the students who will get subsidies are truly poverty-stricken.

Most scholars analyzed from the macro view how to do better in the process of subsidizing poverty-stricken students and provided their solutions. They probably get too general results and seldom have practical methods which could be put into use effectively and efficiently. Besides, they never use information technology such as Big Data to solve these problems. Based on the fact, we introduced a practical approach which has been creatively adopted by University of Science and Technology of China is based on Big Data and can be easily adopted by other colleges.

### **3. Current situation of subsidizing poverty-stricken students in Chinese colleges**

#### *3.1 Achievements*

In the past few decades, Chinese government has made great effort in subsidizing poverty-stricken students and also has obtained great accomplishments. According to Chinese Students Financial Assistance Development Report in 2015 issued by The National Students Financial Assistance Management Center August 26th, 2016, governments, colleges and universities and other social groups in total have aided 41,415,800 person-times in 2015. The number of subsidizing finance reaches to RMB 84.797 billion, increasing by 18.29% and RMB 13.111 billion from 2014.

Beside the increase of total amount, the subsidizing channels have also increased a lot, taking initial shape of the subsidization system including scholarship and grants, state-subsidized student-loan, emergency allowance, food allowance, tuition waiver, financial support for freshmen, work-study program and so on both in national level and in college level. All these measures have guaranteed the students' opportunity for education, satisfied the students' basic economic needs, and prevented them from dropping out with economic reasons.

#### *3.2 shortcomings*

Although Chinese colleges have made great achievements on supporting and subsidizing poverty-stricken students in the past decades, there are still some shortcomings in the commonly-used approaches of granting subsidies currently.

##### **3.2.1 The definition of "poverty-stricken students" is not based on scientific investigation.**

Most colleges define poverty-stricken students still according to students' own applications. Most students who apply for subsidies will get them as long as no classmates oppose. However, Students from different places have different understanding and definition of being "poverty-stricken". China is such a vast area and there is still a big economy gap between east and west regions. Students from rich cities may think themselves poverty-stricken when they can't afford an apple phone or a luxurious bag. While others from poor areas may think affording to eat two vegetables in canteen every lunch is well-off.

Beside this, most of the real poverty-stricken students in college, who have passed the college entering examination and succeeded in the most severe competition in China in spite of all the difficulties and obstacles poverty brings, have tough spirit and perseverance but vulnerable hearts inside. They may not apply for subsidies. They sometimes take the very hard life for granted or may not want others see the difficulties they are experiencing and even hide them. Therefore, using this application measures, subsidies frequently go to some well-off students, whereas really poverty-stricken students haven't obtained the support.

##### **3.2.2 The current granting approach is inhumane.**

There are three reasons for that.

Reason Number One: Recent years, in all the supporting finance governments give to different levels of school throughout the country, the money colleges and universities get is not enough. Therefore, social groups, including individuals, social organizations, and enterprise and public institutions and so forth, gradually become inseparable parts of money resources. Social groups, especially private groups, usually do not donate money anonymously. They do good deeds with their own private intentions. In most cases, they want to make advisement of it in order to improve their publicity. Hence, there will be some public activities held by the donors, usually the social groups, and college authorities joint-handily, which poverty-stricken students who want to get the money must participate in.

Reason Number Two: The past few decades has witnessed both the tremendous economic accomplishments China has made and the gradually popular decadent ideas Chinese people have held such as money worship, hedonism and so forth. Stories of the so-called Rich Second Generation' luxurious lives have flooded the media, which especially influence Chinese young people. They have begun to hold the opinion that being rich means everything while being poor means lack of abilities, lack of competitiveness, unprosperous future and so on. Being poor is been looked upon. Since they no longer live in the former poor neighborhood with poor kids and now live on campus with so many rich students together, students from poverty-stricken families are under different levels of psychological pressure.

Reason Number Three: According to survey, students from poverty-stricken families tend to be more sensitive and self-contemptuous. It's true that at the beginning of college life, they are hard to be outstanding as before. They don't have the competitiveness in dancing, singing, calligraphy or other talents shows because their parents can't afford the high tuition fees learning talents need. They can't stand out in foreign language speaking contest because even their former teachers have never seen a foreigner in their small village for their whole life. They sit quietly when other kids are gossiping the coolest movie stars in Korean or US because they don't have the access to the stories without a smart phone. There is a popular Chinese saying going like this: In order to drink coffee with you today, I've spent 20 years struggling to death. Considering all these unfairness and other nearly cruel situations, it's not surprising that the poverty-stricken students are much more sensitive.

However, after they admit their poverty publicly and apply for the subsidy with all their courage, they still have to wait. The long processes of obtaining the subsidies including having to take part in some public actives or showing their gratitude in public become severe mental tortures for their young and vulnerable hearts. In many cases the inside mental humiliations they get overweight the limited amount of subsidies.

Based on the above, as a result of the inhumane granting measures, poverty-stricken students who are always vulnerable with high self-esteem get the subsidies often feel embarrassed and even humiliated. It has severely discouraged the students and unintentionally distorted the college authorities and the donators' good intentions.

#### **4. An approach to subsidizing poverty-stricken students based on big data**

##### *4.1 The current situation of application of big data in education*

With the arrival of information age and accumulation of a large number of data, Big Data, as a new natural resource, has played an important role in people's lives. By making full use of information technology and multimedia technology, Educational informalization has also made great developments. Big Data Technology, basing on cloud computing, mobile internet, data mining and so forth, has supported education research a lot by providing data acquisition, data store, data analysis, data decision and other techniques.

##### *4.2 Definition of "poverty-stricken students" by using big data*

As we have analyzed above, the current definition of poverty-stricken students is not based on scientific investigation, which caused lots of shortcomings in granting subsidies. By using Big Data, we could probably solve these problems.

As survey shows, for poverty-stricken students, food cost is still the largest proportion of living cost. In order to evaluate different poverty levels of these students, we should collect and analyze students' consumption data in school canteen. Most colleges in China have applied Consumption Card System on campus. Students' expenditure on every meal and any other consumption on campus are recorded. It's easy to obtain data.

##### *4.3 Introduction and explication of this approach*

This granting approach, based on all calculation and analysis of all students' one-month consumption data in school canteen in a certain college, will be a replacement or at least supplement of the subsidy granting system.

###### **4.3.1 The calculating method of the subsidies in the $i+1$ th month**

First, we divide all students' one-month consumption data in school canteen in a certain college into two parts according to gender and compute them respectively, because their normal consumption level on every meal is different, commonly male students' normal consumption level higher than female students'.

Then, based on regional consumption level, canteen food prices and financial support college gives to canteen and other relevant factors, we conduct a comprehensive analysis.

According to the results analyzed, we have a hypothetic model. We hypothesize that in the  $i$ th month male students' standard consumption of every meal is 5 RMB. Of course, we should exclude the data about these male students who only consume less than 1/4 meals in school canteen in a month, because for these male students, canteen is probably not the main consuming place, their data is inaccurate. Besides, the  $i$ th month should not be in summer or winter vacation or October when the 7-day Chinese National Day is in.

Then, we select 10 male students and figure out their average cost for each meal in the  $i$ th month. When working out this data, if the cost for one meal is zero, this meal will not be counted into the total number of meals in this month, because he hasn't had this meal in canteen. Suppose average meal cost of the 10 male students are RMB ¥1, ¥2, ¥3, ¥4, ¥5, ¥6, ¥7, ¥8, ¥9 and ¥10 respectively. Because the standard meal cost for each meal in the  $i$ th month is ¥5, we could grant subsidies to those who spend less than ¥5 for each meal accordingly. That is: to those who spend ¥1, school should grant ¥4 to help him reach the average level; to those who spend ¥2, school should grant ¥3; to ¥3, ¥2; to ¥4, ¥1.

Moreover, school authorities should transfer the appropriate amount of subsidies to poverty students' consumption card directly and privately, without letting other students knowing that, in order to protect their self-pride.

#### 4.3.2 The calculating method of the subsidies in the $i+2$ th month

Above is the granting approach we've introduced. The subsidies granted to poverty-stricken students according to their consumption number in canteen in the  $i$ th month will of course improve their living standard in the  $i+1$ th month somehow. However, when deciding how to subsidize these poverty-stricken students in the  $i+2$ th month, we should consider both their meal cost in the  $i$ th month and the improved consumption level after receiving the subsidies in the  $i+1$ th month. We suppose: Student A improve their average meal cost from ¥2 in the  $i$ th month to ¥5 in the  $i+1$ th month after receiving subsidies, in which case the number of subsidies in the  $i+2$ th month should remain the same; Student B improve their average meal cost from ¥2 to ¥7, in which case the number of subsidies in the  $i+2$ th month should be decreased by ¥2.

Of course there may be some more complicated problems we have to tackle with. Suppose Student C keep his average meal cost ¥4 the same or even reduce to ¥3 in the  $i$ th month. In that case, there are probably two kinds of situations and we should analyze them accordingly.

Situation 1: In this situation, colleges adopt One-Card System, food cards can be used elsewhere on campus, like school super market, school bath room, school restaurants or school café and so on. Student C doesn't spend more on each meal in school canteen, so he probably spends the subsidies elsewhere on campus, which is also an improvement of his living standard.

Situation 2: In this situation, without One-Card System, food cards cannot be used elsewhere on campus. Student C keep spending ¥4 or reducing to ¥3 after receiving ¥1 subsidies in the  $i+1$ th month, which means he only have to deposit ¥3 or ¥2 into the food card by himself, saving ¥1 or ¥2 in cash which can be used elsewhere to improve life.

In both two situations, the subsidies should keep the same in the  $i+1$ th month.

#### 4.3.3 The calculating method of the subsidies in the $i+n$ th ( $n \in \mathbb{N}$ , $n \geq 2$ ) month

In general, we can work out the subsidies in the  $i+n$ th ( $n \in \mathbb{N}$ ,  $n \geq 2$ ) month through this calculating method. Besides, we need to point out that the monthly subsidies should not be more than ¥5, since the average meal cost of this college is ¥5. If when the amount of monthly subsidies reaches to ¥5, the student still spends less than ¥5 on each meal, there must be something in it. The student may suffer from extreme poverty and are not sure whether the subsidies can continually be granted. They may just save for the future. But he may also deliberately use less than the average amount of each meal in order to get more subsidies from school. Whatever, college instructors should ask the student in private for more information and take effective measures accordingly.

## 5. Conclusion

In this research, the current situations of granting subsidies to poverty-stricken college students in China has been described and shown. China has made great achievement on helping poor students but there is still something we could do better. The current method of granting subsidies is not based on scientific investigation and is not agreeable to poverty-stricken students. Base on this, we introduced this approach which University of Science and Technology of China has used to help students and got good feedback and tried to illustrate how this new approach functions and what kind of improvement can be gained by adopting this approach. There is much left to discover and many ways to develop the approach so as to suit the occasion. A dream situation for all: every poverty-stricken student can get help; every help can go to poverty-stricken ones. In the future, we will continue exploring this issue, doing research on performance evaluation of this granting approach. Plus, we will expand our research field, evaluating other performances governments and colleges have already conducted and studying promotion measures to aid poverty-stricken students better.

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